

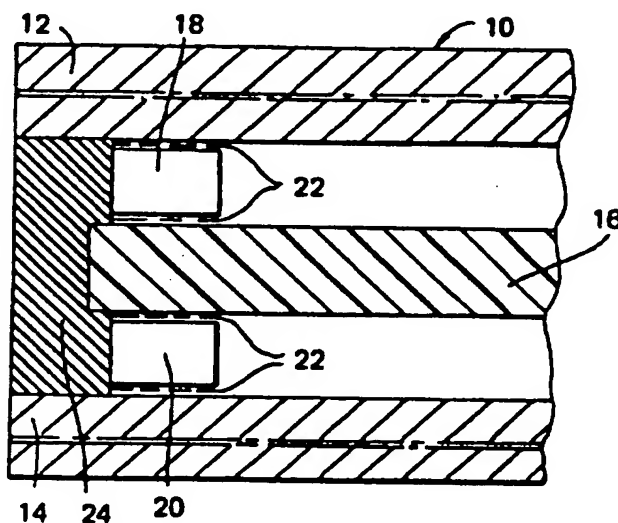
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## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<b>(21) International Application Number:</b> PCT/GB96/00957 <b>(22) International Filing Date:</b> 22 April 1996 (22.04.96) <b>(30) Priority Data:</b> 9508192.3 21 April 1995 (21.04.95) GB <b>(71)(72) Applicant and Inventor:</b> ENNIS, Paul, Stephen [GB/GB]; Units 10 & 11, Hemmons Road, Longsight, Manchester M12 5SJ (GB). <b>(74) Agent:</b> KELVIE, George, Thomas; Urquhart-Dykes & Lord, 3rd floor, Northern Assurance Buildings, Albert Square, Manchester M2 4DN (GB).		<b>(81) Designated States:</b> AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>With international search report.</i>

**(54) Title:** GLAZED WINDOW UNIT**(57) Abstract**

A central layer (16) comprising a sheet of indestructible translucent plastics material is mounted between inner and outer layers (12, 14) both of glass, without any direct bonding therebetween. By means of spacers (18, 20), gaps may be provided between the central layer (16) and the respective inner and outer layers (12, 14) so as to provide a triple glazed unit with enhanced security. Alternatively, no gaps may be provided, the central layer (16) being directly sandwiched between the inner and outer layers (12, 14), in the cavity defined by the spacers, which are then disposed between the inner and outer layers (12, 14).



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Glazed Window Unit

This invention concerns a glazed window unit. In particular, though not exclusively, the invention relates to a triple glazed security window unit which can also be an insulating window unit.

Triple glazed insulating units comprising three sheets of glass with spaces therebetween are, of course, well known for their enhanced thermal and sound insulation properties compared to single sheets of glass or conventional double glazed units. Also known are various laminates of glass or of glass and plastics, usually resins, which are thicker and stronger than plain glass sheets and afford a measure of resistance to attack and breakage.

An object of the present invention is to provide a particular construction of glazed window unit having enhanced attack resistance properties and, optimally, enhanced sound and thermal insulation properties.

According to the invention a glazed window unit consists of three layers, namely a central layer comprising a glazed

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In triple glazed embodiments in accordance with the present invention there are gaps between the inner and central layers and the central and outer layers, respectively, and these gaps are conveniently in the range of 3 to 24 mm, most suitably about 6 mm. During production of such a window unit, the three layers are assembled with spacer material, eg spacer bars, adjacent the edges of the layers to hold the inner and outer layers apart from the central layer by the selected gap distance. A bonding agent is provided on both faces of the spacer material to form a primary seal between the respective adjacent layers.

Alternatively, particularly if a small gap is to be provided between the layers (eg of 1 - 2 mm only) to reduce the overall thickness of the insulating unit, inserts of tape impregnated with desiccant may be sufficient to space them apart instead of spacer material.

A preferred range of thickness of such a triple glazed unit, that is to say from the inner surface of the inner layer to the outer surface of the outer layer is between 24 mm and 32 mm.

Such a window unit is preferably constructed by what is known as a dual seal process. The first seal, known as the primary seal, is provided by the bonding agent on the spacer material and initially seals the spacer material to the respective

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Figure 1 is a partial section through a first embodiment of a window unit according to the present invention;

Figure 2 is a partial section through a second embodiment of a window unit according to the present invention; and

Figure 3 is a partial section through a third embodiment of a window unit according to the invention.

Referring to figure 1 there is shown a triple glazed security and insulating window unit 10. The unit comprises inner and outer layers 12 and 14 of laminated glass and a central layer 16 of indestructible translucent plastics material available under the registered trade mark LEXAN.

The layers 12, 14 and 16 are assembled together with the provision of spacer bars 18 and 20 between the layers 12 and 16 and 16 and 14 respectively. A primary seal 22 is provided between the spacer bars 18 and 20 and the central layer 16 and each of the outer layers 12 and 14 respectively.

A secondary seal 24 provides the outer seal for the window unit to provide a barrier to the ingress of moisture.

In a further arrangement (not shown) the spacer bars 18 and 20 can be replaced by a length or lengths of spacing material, such as that available under the trade mark EDGETECH. This

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The central layer 16 itself is sized to provide a small gap 30 around at least three of its edges so that it is free to move laterally within the space defined by the channel section members 28.

Because of the provision of a peripheral gap 30 around at least three sides of the central layer 16 the layer 16 can expand and contract without affecting either the primary or secondary seals 22, 24.

However, the window unit 26, whilst remaining effective as a security window unit, may not have the full insulating properties of the window unit 10 illustrated in figure 1, the reason being that air in the exterior cavity, ie the gap between layers 14 and 16, is in communication with air in the inner cavity, ie the gap between layers 12 and 16.

Referring to figure 3, there is shown a window unit 32 where there are no gaps or only negligible gaps between the central layer 16 of indestructible plastics laminate and the inner and outer layers 12, 14 of laminated glass. The same reference numerals have been used in respect of this embodiment as in the previous two for parts which are directly compatible.

Spacer bars 20 are provided in this case between the inner and outer layers 12, 14, a primary seal 22 being formed between the bars 20 and the respective inner and outer layers. The

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It is recommended that the installation of window units is carried out in accordance with a non-removable procedure. For example, the window unit should be bedded and internally sealed with a non-hardening compound, such as a silicone sealant, appropriate for glass and plastic combined, ensuring that there is a strong adhesion between an interior uPVC rebate and the surface of the inner leaf of glass of the window unit.

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7. A unit as claimed in any preceding claim wherein the outer layer and the inner layer are each spaced from the central layer.
8. A unit as claimed in claim 7 wherein the outer layer and the inner layer are each spaced from the central layer by a respective gap in the range 3 to 24mm in thickness.
9. A unit as claimed in any preceding claim wherein the central layer has edges which are fitted into channel section members and is sized to provide a small gap around at least three of its edges so that it is free to expand laterally within the space defined by the channel section members.
10. A unit as claimed in any of claims 1 to 6 wherein the central layer is sandwiched between the inner and outer layers and surrounded by spacer means which are connected to the inner and outer layers.
11. A unit as claimed in claim 10 wherein the central layer is sized to provide a small gap between at least three of its edges and the spacer means so that it is free to expand laterally within the space defined by the spacer means.

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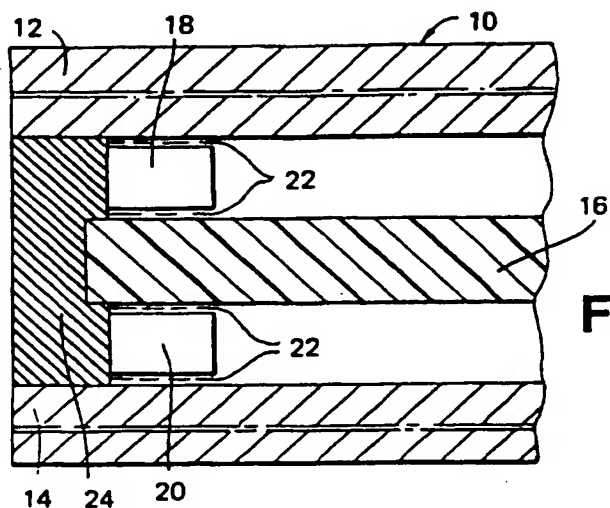


FIG. 1

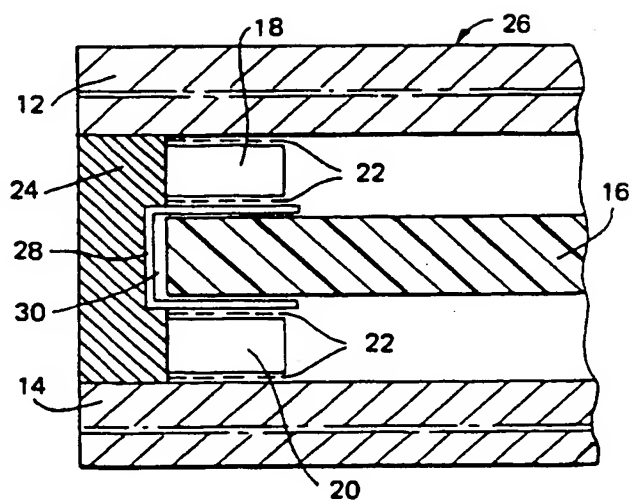


FIG. 2

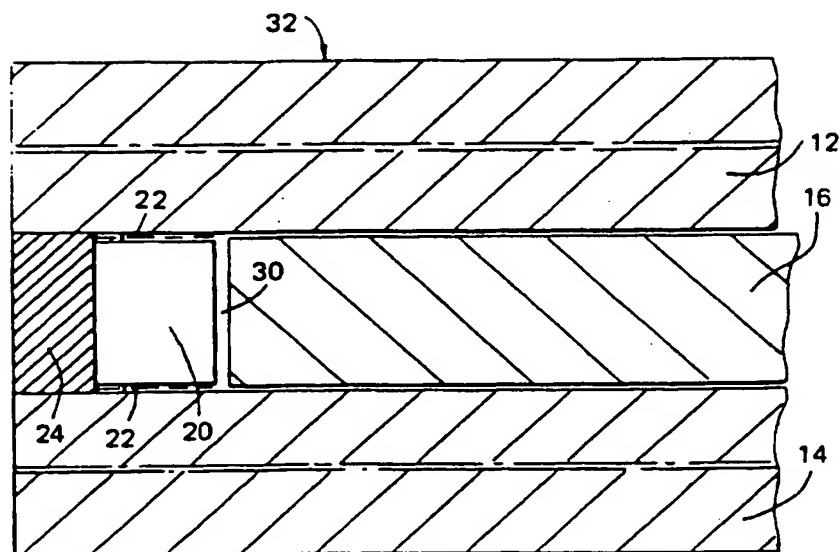


FIG. 3

SUBSTITUTE SHEET (RULE 26)



**INTERNATIONAL SEARCH REPORT**

Information on patent family members

Int. l. Application No

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Patent document found in search report	Publication date	Patent family member(s)	Publication date
US-A-4368226	11-01-83	NONE	
FR-A-2158317	15-06-73	SE-B- 370754	28-10-74
		DE-A- 2250549	03-05-73
		US-A- 3837129	24-09-74
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